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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,502	07/23/2003	Kyoichi Sumida	14633.1US01	1967

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EXAMINER	
FETTEROLF, BRANDON J	

ART UNIT	PAPER NUMBER
1642	

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/626,502	SUMIDA ET AL.	
	Examiner	Art Unit	
	Brandon J. Fetterolf, PhD	1642	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,8-12,14 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,8-12,14 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 February 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to the Amendment

The Amendment filed on 02/02/2006 in response to the previous Non-Final Office Action (11/02/2005) is acknowledged and has been entered.

Claims 1, 8-12, 14 and 16 are currently pending and under consideration.

Specification

The amendment filed on 02/02/2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the change of concentration from mg/mL to ng/mL. While the Examiner recognizes that Applicants have amended "dL" to recite "mL", Applicants have not provided any reasoning for amending the specification and figure to recite a nanogram/milliliter vs. a milligram/milliliter. In the instant case, there appears to be a huge difference between a milligram and a nanogram.

Applicant is required to cancel the new matter in the reply to this Office Action.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Rejections Maintained:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eda et al. (U.S. 6248,597, 2001) in view of Shigenobu et al. (WO 02/018953, 2002).

(Note: All references to the Shigenobou et al. WO publication will be directed to the English translated EP patent application (EP 1314982 A1, 2003))

Eda et al. teach an agglutination immunoassay of an antigenic analyte comprising performing an antigen-antibody reaction in the presence of a microparticle, wherein the microparticle includes polymeric materials as well as copolymers thereof (column 4, line 67 to column 5, line 5 and column 7, lines 12-19). With regards to the antigenic analyte, the patent teaches (column 5, line 47) that the antigenic analyte may be a tumor marker such as prostate specific antigen (PSA).

Eda et al. does not explicitly teach that the polymer and/or copolymer is represented by the monomer presented in formula [2] and a monomer selected from the group consisting of acrylic acid or acrylate ester, or methacrylic acid or methacrylate ester or styrene. Further, Eda et al. does explicitly teach a kit comprising a copolymer obtained by polymerizing a monomer of formula [2] with a second monomer and a prostate specific antibody.

Shigenobu et al. teach a method of improving the reproducibility of an agglutination immunoassay comprising allowing an antigenic substance in a sample to bind to insoluble carrier particles and allowing an antibody or an antibody complex which reacts specifically to the antigenic substance to bind to the antigenic substance in the presence of a polymer (page 2, line 25 and lines 43+). With regards to the insoluble carrier, Shigenobu et al. teach (page 4, lines 24-39) that the insoluble carrier may be latex. With regards to the polymer, the reference teaches (page 5, lines 4-29) that the polymer includes either a polymer having a monomer unit derived from the patently disclosed monomer represented by the general formula [2], wherein the monomer represented by formula [2] is that of 2-methacryloyloxethyl phosphorylcholine (see Sakaki et al. J. Biomedical Materials Research 1999; 47: 523-528 for structure) or a copolymer obtained by polymerizing the monomer represented by 2-methacryloyloxethyl phosphorylcholine with a "second" monomer selected from the group consisting of (meth)acrylates such as acrylate ester, a methacrylate ester, butyl methacrylate or styrene derivatives. Shigenobu et al. further teach (page 5, lines 50-58) that the ratio of the monomer unit derived from 2-methacryloyloxethyl phosphorylcholine in the copolymer is from 1% to 100% and the total polymer molecular weight is 100 to 1,000,000. In addition to the agglutination assay described above, the WO document teaches (page 8, lines 36-47)

a reagent kit for an immunoassay comprising combining a reagent containing a copolymer obtained by polymerizing 2-methacryloyloxethyl phosphorylcholine with a monomer as described above, an antibody that binds to the antigen in the sample, and an insoluble carrier protein such as latex, wherein the carrier protein supports the antigen.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Eda et al. and Shigenobu et al because each of the immunoassays have been individually taught in the prior art to be successful at the detection of antigens. Further, one would have been motivated to do so because as taught by Shigenobu et al., it is difficult to have a reaction in an agglutination immunoassay, which has good reproducibility due to the non-uniformity of agglutination in an agglutination reaction of the insoluble carrier particles with antigens or antibodies (page 2, lines 19-20). Thus, one of ordinary skill in the art would have a reasonable expectation that by combining the agglutination assay for PSA as taught by Eda et al. with the polymeric material used in the agglutination immunoassay as taught by Shigenobu et al., one would successfully achieve a highly reproducible agglutination immunoassay for prostate specific antigen.

In response to this rejection, Applicants contend that claim 1 is directed to an immunoassay method of a prostate-specific (PSA) comprisign performing an antigen-antibody reaction in the presence of a copolymer obtained by polymerizing a monomer represented by the following general formula [2] an aralkyl methacrylate or derivative thereof and claim 11 is directed to a kit for immunoassay of PSA comprising a reagent containing the same copolymer and a reagent containing an antibody to a prostate-specific antigen or a prostate specific antigen. As such, Applicants assert that the Office has recognized that the cited references do not teach or suggest the polymer obtained by polymerizing 2-methacyrloyloxyethyl phosphorylcholine and benzyl methacrylate. Likewise, Applicants submit that the cited references do not teach or suggest the copolymer obtained by polymerizing the monomer of the general formula [2] and an aralkyl methacrylate or derivative thereof. Therefore, Applicants contend that the cited references do not suggest any motivation to combine their teachings to arrive at the claimed invention.

These arguments have been carefully considered, but are not found persuasive.

In response to Applicants assertion that the cited references do not teach or suggest the polymer obtained by polymerizing 2-methacyrloyloxyethyl phosphorylcholine and an aralkyl

methacrylate, such as benzyl methacrylate, or a derivative thereof, the Examiner acknowledges that the cited references do not explicitly teach the polymerization of 2-methacyrloyloxyethyl phosphorylcholine with an aralkyl methacrylate such as benzyl methacrylate. However, the Examiner recognizes that the claims do not specifically limit what the derivative of an aralkyl methacrylate maybe. Therefore, Shigenobu et al. disclosure that meth(acrylate) derivatives include, but are not limited to, methyl (meth)acrylate, ethyl (meth)acrylate, n-butyl (meth)acrylate, iso-butyl (meth)acrylate, pentyl (meth)acrylate, hexyl (meth)acrylate, heptyl (meth)acrylate, octyl (meth)acrylate, tridecyl (meth)acrylate and 2-hyroxyethyl methacrylate meets the limitation of a derivative of an aralkyl methacrylate (page 5, paragraph 0016). As such, claims 1-4 and 9-12 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Eda et al. (U.S. 6248,597, 2001) in combination with Shigenobu et al. (WO 02/018953, 2002).

New Rejections Upon Reconsideration of the Prior art:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eda et al. (U.S. 6248,597, 2001) and Shigenobu et al. (WO 02/018953, 2002) in further view of Craig et al. (US 4,401,765, 1983)

(Note: All references to the Shigenobou et al. WO publication will be directed to the English translated EP patent application (EP 1314982 A1, 2003).)

Eda et al. and Shigenobu et al. teach, as applied to claims 1 and 9-12 above, a light scattering agglutination immunoassay comprising allowing an antigenic substance in a sample to bind to insoluble carrier particles and allowing an antibody or an antibody complex which reacts specifically to the antigenic substance to bind to the antigenic substance in the presence of a copolymer

obtained by polymerizing the monomer represented by 2-methacryloyloxethyl phosphorylcholine with a methacrylate derivative including, but not limited to, methyl (meth)acrylate, ethyl (meth)acrylate, n-butyl (meth)acrylate, iso-butyl (meth)acrylate, pentyl (meth)acrylate, hexyl (meth)acrylate, heptyl (meth)acrylate, octyl (meth)acrylate, tridecyl (meth)acrylate and 2-hyroxyethyl methacrylate (page 5, paragraph 0016 of the EP 1314982 publication). Eda et al. and Shigenobu et al. further teach a reagent kit for an immunoassay comprising combining a reagent containing a copolymer obtained by polymerizing 2-methacryloyloxethyl phosphorylcholine with a monomer as described above, an antibody that binds to the antigen in the sample, and an insoluble carrier protein such as latex, wherein the carrier protein supports the antigen. With regards to the antigenic analyte, Eda et al. and Shigenobu et al. teach that the antigenic analyte may be a tumor marker such as prostate specific antigen (PSA).

Eda et al. and Shigenobu et al. do not explicitly teach the polymerization of 2-(meth)-acyrloyloxyethyl phosphorylcholine with an aralkyl methacrylate such as benzyl methacrylate

Craig et al. teach novel particle reagents for light scattering agglutination immunoassays (Abstract). With regards to the particle reagents, the patent teaches that the particle reagents consist of a core polymer of high refractive index and a shell material which is capable of covalently binding to compounds of biological interest (column 3, lines 35-42). With regards to the core polymers, the patent teaches that polymers with high aromaticity such as benzyl methacrylate are preferred over aliphatic polymers because of their high refractive indices (page 5, lines 1-4 and line 52).

It would be *prima facie* obvious at the time the invention was made to generate a copolymer obtained by polymerizing 2-methacryloyloxethyl phosphorylcholine with benzyl methacylate instead of the aliphatic methacrylates as taught by Eda et al. and Shigenobu et al. for the use in light scattering agglutination immunoassay in view of the teachings of Craig et al. that polymers with high aromaticity such as benzyl methacrylate are preferred over aliphatic polymers because of their high refractive indices. One would have been motivated to do so because Craig et al. teach that light scattering properties of particle suspensions depend on several variables including the refractive indices, wherein the selection of core material is important in optimizing the sensitivity (column 3, lines 43-51). Thus, one of ordinary skill in the art would have a reasonable expectation that by using a copolymer obtained by polymerizing 2-methacryloyloxethyl phosphorylcholine with benzyl methacylate instead of the aliphatic methacrylates as taught by Eda et al. and Shigenobu et al. in view

of the teachings of Craig et al., one would successfully achieve an agglutination immunoassay for prostate specific antigen which has higher sensitivity.

Therefore, NO claim is allowed

All other rejections and/or objections are withdrawn in view of applicant's amendments and arguments there to.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon J. Fetterolf, PhD whose telephone number is (571)-272-2919. The examiner can normally be reached on Monday through Friday from 7:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Siew can be reached on 571-272-0787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brandon J Fetterolf, PhD
Examiner
Art Unit 1642

BF

JEFFREY SIEW
SUPERVISORY PATENT EXAMINER